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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/843,234	MIHCAK ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,32-34,38 and 40-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *40-46* is/are allowed.

6)☒ Claim(s) *1-6,32,34 and 38* is/are rejected.

7)☒ Claim(s) *47 and 48* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *010705, 100104*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicant's amendments and arguments filed 8 March 2005, have been entered and made of record.

Response to Amendments and Arguments

2. Regarding claims 1 and 38, Applicant asserts that Carlstrom does not teach deriving a recognition value, as claimed (see pp. 21-23 of Applicant's Remarks). First, Applicant asserts that Carlstrom "does not produce a single recognition value for a distinguishing object ... This alone distinguishes these claims from Carlstrom" (p. 21). In response, Examiner points out that the claims do not preclude the derivation of multiple recognition values. Claim 1 merely calls for "deriving a recognition value" and does not include qualifying language such as "deriving only one recognition value," which would make it clear that only one recognition value for a digital signal is to be derived.

Also, on pp. 22-23, Applicant asserts that Carlstrom does not disclose (1) "perceptually distinct digital signals result in recognition values that are approximately independent of one another," and (2) "perceptually similar digital signals result in proximally similar recognition values." Examiner maintains that Carlstrom's disclosure does teach these two limitations, and reference will be made to figures 1-3 of Carlstrom for the explanation:

Figure 1 shows a digital signal. Figure 2 shows four columns contained in the digital signal of figure 1. [It should be noted that each of the columns, or sub-arrays, of image data in

figure 2 constitute a digital image signal – they are each an image signal consisting of eight pixels.]

Each of the four sub-arrays is then mapped to a hashing value, which corresponds to a recognition value. Figure 3 illustrates the process of hashing. The first sub-array (11111111), shown at the bottom of figure 3, is mapped to a hash value that indicates the set of possible letters that the first sub-array could possibly be a part of. The hash value is shown as a 26-bit binary string that indicates the set of letters having a solid vertical line in the leftmost portion of the letter – i.e. the set of B, D, E, F, H, K, L, M, N, P, and R.

Thus, the hash value representative of the first sub-array is derived such that perceptually similar characters (i.e. those having a leftmost vertical line spanning the height of the letter – B, D, E, F, H, K, L, M, N, P, and R) result in proximally similar recognition values. In this example, the perceptually similar characters will the leftmost vertical line would have the same recognition value corresponding to the above set of possible characters. Also, the hash value is derived such that perceptually distinct signals result in hash values that are approximately independent of one another. For example, the letter L and the letter J are perceptually distinct with respect to the leftmost vertical column. Therefore, their hash values for the leftmost column are independent of each other. However, J and L are perceptually similar at the second column, as shown in figure 3, so the two letters are given the same hash value for the second column.

The above hashing process is repeated for the 2^{nd}-4^{th} columns to obtain hash values indicative of the sets of possible solutions for each of the respective columns – (J, L, and U), (L and W), and (L, U, and V), respectively. After the hash values of the four columns have been generated, the 26-bit hash values are simply ANDed at the combining circuitry 216, figure 18, in

order to generate the output set of possible characters. In this example, ANDing the four hash values together would generate a hash value that contained only the letter "L".

The claimed "recognition value" therefore directly corresponds to the hash value generated for each sub-array. The hash value of each sub-array is derived so that perceptually distinct sub-arrays are given different, or independent, hash values, and perceptually similar sub-arrays are given proximally similar (i.e. the same) recognition values.

An alternative interpretation is that the set of four hash values constitutes a single recognition value for the overall digital signal; however, such an interpretation is not relied upon here.

3. Regarding claim 32, Applicant argues that Carlstrom does not disclose the claimed recognition value. As explained above for claims 1 and 38, Carlstrom is considered to teach such a feature. Also regarding claim 32, Applicant argues that Carlstrom's median filter does not anticipate the claimed "non-linear filtering" (see p. 25 of Applicant's Remarks). Examiner disagrees with this assertion. As is notoriously well-known in the art of image processing, the median filter is a non-linear spatial filter that replaces each pixel value with the median of the pixel values within a kernel of a chosen size and shape centered at a pixel of interest. In column 20, Carlstrom describes such a filter.

Claim Objections

4. Claims 47-48 are objected to because of the following informalities: in claim 47, "deriving a recognition value comprising" should be -- deriving a recognition value comprises --. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 32-34, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,875,264 by Carlstrom.

Regarding claims 1 and 38, Carlstrom discloses a computer-implemented method facilitating similarity recognition of a digital signal, the method comprising:

obtaining a digital signal (camera 202 in figure 18 obtains a digital image signal); and

deriving a recognition value (figure 18: output mapping circuitry 206 derives recognition values for each of a plurality of patterns contained in the digital signal) representative of the digital signal such that perceptually distinct digital signals result in recognition values that are approximately independent of one another and perceptually similar digital signals result in proximally similar recognition values (in figure 18: different sub-arrays of the digital image signal are input to a hashing mechanism 206, which maps the patterns contained in each of the sub-arrays to an associated memory 208-212, thereby deriving a "hashed," or recognition, value for each sub-array;

each memory contains a set of possible pattern recognition values (or "solutions") for the associated image portion - see figures 1-3;

then the combining circuitry 216 combines the sets of recognition values to yield a final recognition value (e.g. a character) that is representative of the overall pattern;

the system is trained so that different patterns or characters can be distinguished based on their recognition (i.e. hash) values - in other words, the recognition values of perceptually similar patterns are similar, and the recognition values of perceptually distinct patterns are dissimilar).

Regarding claim 2, Carlstrom discloses, a method as recited in claim 1 further comprising comparing the recognition value with another recognition value derived from another digital signal (figure 4: the recognition value of a first sub-array W is compared to the derived recognition values of the other sub-arrays X, Y, and Z).

Regarding claim 3, Carlstrom discloses a method as recited in claim 1, wherein the recognition value is a hash value (mapping circuitry 206, figure 18, derives a hash value as the recognition value for each sub-array).

Regarding claim 4, Carlstrom discloses, a method as recited in claim 1, wherein the digital signals are digital image signals (camera 202 is a digital camera).

Regarding claim 5, Carlstrom discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 1 (i.e. Carlstrom's method is disclosed as being computer-implemented and comprises computer instructions on a medium).

Regarding claim 6, Carlstrom discloses a computer comprising one or more computer-readable media having computer-executable instructions that, when executed by the computer,

perform the method as recited in claim 1 (i.e. Carlstrom's method is disclosed as being computer-implemented and comprises computer instructions on a medium).

Regarding claim 32, Carlstrom discloses a computer-implemented method facilitating similarity recognition of a digital signal, the method comprising:

obtaining a digital signal (camera 202 in figure 18 obtains a digital image signal);

non-linear filtering of the signal to eliminate isolated significant components of the signal (figures 24 and 25 and column 20, lines 52-61: a non-linear median filter is used to remove "isolated pixel noise");

deriving a recognition value from the filtered signal, the recognition value being representative of the digital signal such that perceptually distinct digital signals result in recognition values that are approximately independent of one another and perceptually similar digital signals result in proximally similar recognition values (i.e. the mean-filtered signal is applied to the system of figure 18 and produces the claimed recognition value - see the explanation for claim 1).

Regarding claim 33, Carlstrom discloses a method as recited in claim 32, wherein isolated significant components of the signal are those that are geometrically weak (figure 20, lines 52-61: the pixels that are removed are geometrically weak - that is, they are not strongly connected to their neighbors).

Regarding claim 34, Carlstrom discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in

claim 32 (i.e. Carlstrom's method is disclosed as being computer-implemented and comprises computer instructions on a medium).

Allowable Subject Matter

7. Claims 40-46 are allowed. Claims 47-48 would be allowable if claim 47 is rewritten to overcome the above claim objection.

8. Regarding claims 40, 45, and 47, Carlstrom discloses deriving a recognition value representative of a digital signal such that perceptually distinct digital signals result in recognition values that are approximately independent of one another and perceptually similar digital signals result in proximally similar recognition values, as explained above. However, Carlstrom does not disclose that deriving the recognition value includes the steps of: transforming, quantizing, geometric-region-growing, and generating, as claimed. For this reason, claims 40, 45, and 47 are allowable.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

VIKRAM BALI
PRIMARY EXAMINER

CML
Group Art Unit 2623
28 June 2005